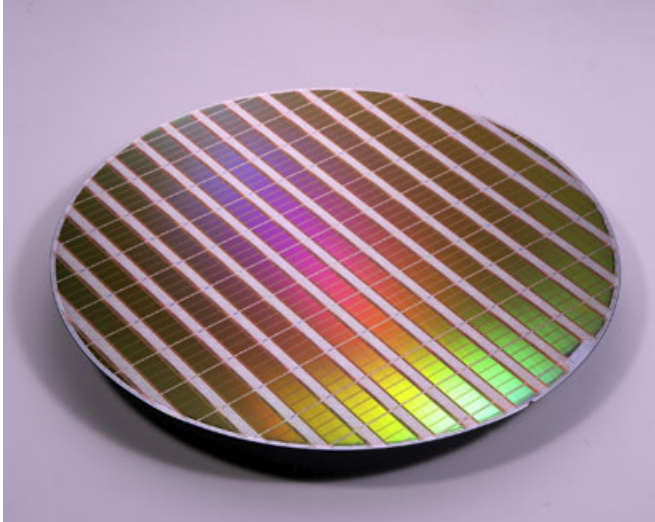


# TSMC, ARM see impressive results with FinFET process

5 October 2014, by Nancy Owano



Technology from a Taiwanese semiconductor foundry is to bring considerable benefits in performance and power efficiency to big.LITTLE implementations, in the name of FinFET. Hsinchu, Taiwan-based TSMC announced last month it had successfully produced the first fully functional ARM-based [networking](#) processor with FinFET technology and explained how TSMC's 16FinFET process promises speed and power improvements as well as leakage reduction.

The advantages address "challenges that have become critical barriers to further scaling of advanced SoC technology. It has twice the gate density of TSMC's 28HPM process, and operates more than 40 percent faster at the same total power, or reduces total power over 60 percent at the same speed." Last month the company also announced 16nm FinFET (16FF) process technology improvements in light of a collaboration between ARM and TSMC to jointly optimize the 64-bit ARMv8-A processor series on FinFET process technologies. TSMC and ARM set [new](#) benchmarks for performance and power efficiency with FinFET Silicon with 64-bit ARM big.LITTLE technology. Silicon results on 16FF showed the

"big" Cortex-A57 processor achieving 2.3GHz for sustained mobile peak performance, as well as the "LITTLE" Cortex-A53 processor consuming only 75mW for most common workloads. The company said TSMC's 16FF+ process technology will deliver an additional 11 percent gain in performance for the Cortex-A57 at the same power as the 16FF process, and a further 35 percent power reduction for the Cortex-A53 when running low-intensity applications. The 16FF+ is scheduled to be delivered by Q4 2014.

Work continues, meanwhile, to advance the technology. Earlier this month, ARM and TSMC announced a multi-year agreement to deliver ARMv8-A processor IP [optimized](#) for TSMC 10FinFET process technology. The announcement said that TSMC will apply "the learnings from prior generations of 20SoC and 16FinFET in the ARM ecosystem to offer performance and power improvements at 10FinFET that will be better than previous nodes." Viewing the success in scaling from 20SoC to 16FinFET, ARM and TSMC decided to collaborate again for 10FinFET. The announcement said, "This early pathfinding work will provide valuable learning to enable physical design IP and methodologies in support of customers to tape-out 10FinFET designs as early as Q4 2015." Cliff Hou, TSMC vice president of R&D, said, "Together with ARM, we proved out in silicon the high performance and low power of the big.LITTLE architecture as implemented in 16FinFET. Given the successful adoption of our previous collaborative efforts, it makes sense that we continue this fruitful partnership with ARM in future 64-bit cores and 10FinFET."

According to TSMC, it is the first foundry to provide 28nm and 20nm production capabilities. According to The China Post on Saturday, market watchers noted that the announcement represents TSMC's

resolve to maintain its leading [position](#) in the sector.

**More information: —**

[www.tsmc.com/tsmcdotcom/PRListingNewsAction.do?language=E](http://www.tsmc.com/tsmcdotcom/PRListingNewsAction.do?language=E)

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[www.businesswire.com/news/home/20141002005042/en/ARM-TSMC-Unveil-Roadmap-64-bit-ARM-based-Processors?sf31895244=1#.VDGLrfdUvH](http://www.businesswire.com/news/home/20141002005042/en/ARM-TSMC-Unveil-Roadmap-64-bit-ARM-based-Processors?sf31895244=1#.VDGLrfdUvH)

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